A.2
4/4/96

BLACK & VEATCH
SPECIAL PROJECTS CORP.

101 North Wacker Drive, Suite 1100, Chicago, Illinois 60606, (312) 346-3775, Fax: (312) 346-4781

USEPA/ARCS V
American Chemical Services 80-5PJ7

BVSPC Project 71670
BVSPC File C.3
April 4, 1996

Ms. Sheri Bianchin
U.S. Environmental Protection Agency
77 West Jackson Boulevard (SRW-6J)
Chicago, Illinois 60604

Subject: Comments on American Chemical Services', Inc. (ACS's) March 1996 Perimeter Groundwater Containment System 50 Percent Design Submittal, Griffith, IN

Dear Ms. Bianchin:

Black & Veatch Special Projects Corp. (BVSPC), is pleased to present its review comments of the above referenced document prepared by the ACS Remedial Design/Remedial Action (RD/RA) Executive Committee. This review was done in accordance with BVSPC's Work Plan dated July 1995, as authorized by Work Assignment 80-5PJ7 under U.S. Environmental Protection Agency (USEPA) Contract No. 68-W8-0064.

The comments are generally organized to follow ACS's report in an orderly fashion. BVSPC's efforts under our current Work Assignment are for the benefit of USEPA. The potentially responsible parties (PRPs), their employees, contractors or any other persons or entities are not third party beneficiaries of this Work Assignment. Because a goal of PRP oversight is to hold the PRPs responsible and accountable for the RD/RA, it should be stated to the PRP RD/RA team that the term "approval" is not to be construed as relieving the PRP from full responsibility for their methods and procedures.

We appreciate the opportunity to assist USEPA on this project. Please contact our office if you have any questions.

Sincerely,

BLACK & VEATCH SPECIAL PROJECTS CORP.

Steven R. Mrkvicka

Enclosure
cc: D. Gountanis, USEPA (MCC-10J)
M. Hendrixson, USEPA (MCC-10J)
C. Norman, USEPA (SMC-5J)
R. McAvoy, w/enclosure
R. Lantz, w/enclosure
M. Mastronardi, w/enclosure

s:\projects\ACS\LET8-A

ACS's March 1996 Perimeter Groundwater Containment System 50 Percent Design Submittal Griffith, IN Comments

Comment 1, Section 1.1, Paragraph 1, Sentence 4, Page 1-1

Based on enclosure 1 of the USEPA March 14, 1996 approval of the modifications of the revised Perimeter Groundwater Containment System (PGCS) Remedial Design (RD)/Remedial Action (RA) Work Plan, revise this sentence to: "The purpose of the PGCS is to prevent further offsite migration of contaminants in the upper aquifer groundwater from a portion of the ACS site to adjacent properties."

Comment 2, Section 1.2.1, Paragraph 2, Sentence 1, Page 1-2

Based on the Unilateral Administrative Order (UAO) (IV.6.a., page 7), Statement of Work (SOW) (II, page 1), and the Record of Decision (ROD) (I, page 3) add the inactive portion of the Griffith Municipal Landfill to the list of disposal areas. Change, "the Treatment Lagoons" to "Treatment Lagoon #1 and adjacent areas," based on the UAO (IV. 14.a, page 13).

Comment 3, Section 1.2.1, Paragraph 2, Sentence 2, Page 1-2

After "Although the" insert "active portion of the." Based on the UAO (IV.6.a, pages 7 and 8) "the site is bordered by the...active portion of the Griffith Municipal Landfill," therefore delete "is located within the boundaries of" and add "borders." Based on General Comment 17 in Enclosure 1 of the USEPA March 14, 1996 approval of the modifications of the revised PGCS RD/RA Work Plan, delete "it is not included as part of the remedy," and add "in the final remedy, groundwater from the landfill area must be treated if it exceeds performance standards," since the SOW (II.E.1, page 5) states "the respondents shall design, construct, operate and maintain a groundwater extraction and treatment system to restore groundwater to performance standards.... The Area of Attainment for groundwater performance standards shall include all areas at or beyond the EPA-approved points-of-compliance where contamination levels exceed the performance standards."

Comment 4, Section 2.1.2, Paragraph 1, Last Sentence, Page 2-3

Indicate the basis for using a five year dewatering period.

Comment 5, Section 2.1.2, Paragraph 2, Last Two Sentences and Sentence 2, Page 2-3

Modify these sentences, based on Page 5 in Appendix B of this report, to include "a large volume of source area water (several thousand gallons) could be extracted from the dewatering wells, passed through the treatment system's phase separator and stored in the pretreatment equalization tank." Modify drawings G-4 and I-3 to accommodate offsite disposal of Still Bottoms Pond (SBP) and Offsite Containment Area (OFCA) water.

Include a drawing showing where the temporary barrier will be installed to minimize the SBP and OFCA water extracted.

Comment 6, Section 2.1.2, Paragraph 3, Page 2-3, and Paragraph 4, Page 2-5

The staged approach does not agree with the present worth analysis of Alternatives C and C* described in Appendix A of this report which shows present worth for five years of operation, clarify.

Comment 7, Section 2.1.2, Table 2-1, Page 2-4

Based on Section 2.1.2, paragraph 1, page 2-1, the estimated flow rates for the PGCS and Onsite Containment Area (ONCA) were based on pump tests, previous upper aquifer information, and groundwater modeling. Describe the basis for the OFCA and SBP estimated flows.

Comment 8, Section 2.1.2, Page 2-5

Estimate how long after stage 5 (8 to 10 years) the treatment system will be operating.

Comment 9, Section 2.1.3, Paragraph 1, Sentence 1, Page 2-5

Based on Tables 2-1 and 2-3, clarify if the system will have a designed flow rate of 55 or 60 gpm.

Comment 10, Section 2.1.4, Table 2-2, Page 2-10

Based on Tables C-1 and 2-3, include 1,1-dichloroethane; 1,2-dichloroethane 1,1-dichloroethene; 1,2-dichloroethene-cis; 1,2-dichloroethene-trans; and 1,2-dichloropropane. Clarify the "50/50 SBP/OFCA Unsettled" values for chloroethane, chloromethane, diethyl phthalate, and dimethylphthalate.

Comment 11, Section 2.1.4, Table 2-3, Pages 2-14 through 2-16

Provide sample calculations for the "Design Condition" and "Long-Term Condition" flow-weighted average influent concentrations.

Comment 12, Section 2.1.5, Table 2-4, Page 2-17

Since note (a) does not apply only to PCBs, modify it to comply with Enclosure 2 attachment to the USEPA March 14, 1996, approval of the modifications of the revised PGCS RD/RA Work Plan which states the detection of each PCB is 0.1 μg/l rather than 0.1 μg/l for all PCBs.

Comment 13, Section 2.2, Paragraph 1, Sentence 2, Page 2-18

According to Table 2-2, add calcium and magnesium as major inorganic and chloroethane, tetrahydrofuran and toluene as major organic constituents in PGCS and ONCA groundwater.

Comment 14, Section 2.3.1, Paragraph 1, Last Full Sentence, Page 2-20

Although drawing M-2 (Piping Layout) shows the PGCS and ONCA stream having piping routing it through the ME-1 phase separator, explain why drawings G-4, I-3, and Figure 2-2 do not show this feature.

Comment 15, Section 2.3.1, Paragraph 3, Sentence 1, Page 2-20

After "design criteria for," insert "the pretreatment system,".

Comment 16, Section 2.3.1, Paragraph 4, Sentence 1, Page 2-20

After "components of," insert "the pretreatment system and."

Comment 17, Section 2.3.1, Paragraph 5, Last Sentence, Page 2-20

Modify the Process Flow Diagram G-4 to show how sludge will be removed periodically (as a liquid), from sludge storage tank T-5, by a truck and transported offsite for disposal. Include a description on how dewatered sludge will be managed.

Comment 18, Section 2.3.1, Lines 1 to 3, Page 2-20

Modify drawings G-4 and I-3 to show the piping needed to route the PGCS and ONCA stream to the phase separator as stated here.

Comment 19, Section 2.3.1, Paragraphs 3 and 4, Page 2-20

Include the T-5 storage tank and ME-12 filter press system in Tables 2-5 and 2-6, since these are considered part of the pretreatment system, based on the process description in paragraph 3 on this page; or describe where these items are discussed.

Comment 20, Section 2.3.1, Paragraph 5, Sentence 3, Page 2-20

Modify drawings G-4 and I-3 to show the dewatering well pumps that pump OFCA and SBP fluid "directly into the separator."

Comment 21, Section 2.3.1, Paragraph 5, Last Sentence, Page 2-20

Modify drawings G-4 and I-3 to show how effluent from the T-5 storage tank will be "removed periodically (as a liquid) by a truck."

Comment 22, Section 2.3.1, Tables 2-5 and 2-6, Pages 2-21 to 2-23

These tables describe a future phase separator solids pump; however, drawings G-4 and I-3 show initial "sludge pump" P-12, but no future pump. Clarify. Verify the 9 days storage capacity of the solids storage tank. Review the 10 gpm minimum capacity of the future UV oxidation system, since according to Table 2-1 the flow could be as low as 8 gpm. Show the future steam boiler capacity of 680,000 BTU/M is adequate for the maximum UV oxidation rate of 30 gpm.

Comment 23, Section 2.3.2, Paragraph 2, Lines 1 and 8, Page 2-24

Define the term "reduced iron" or reference page 2 of Appendix B, and after "reduced" insert "(soluble)."

Comment 24, Section 2.3.2, Paragraph 3, Lines 9 and 10, Page 2-24

After "adjustment of the pH" insert ", downstream in the metals removal system,".

Comment 25, Section 2.4, Sentence 3, Page 2-25

Section 2.3.1 on page 2-20 describes the PGCS and ONCA stream as having "the potential for having trace amounts of free phase material" and therefore would be routed to the phase separator located in "the high-strength groundwater pretreatment system." Section 2.1.2, paragraph 2 on page 23, describes the initial SBP and OFCA water as being "gradually bled into the treatment system influent" or being disposed at a "permitted offsite facility." Clarify how the system will operate initially when PGCS and ONCA water is being

separated during initial operation (stage 1 and 2) and after one year. Modify drawings G-4, I-3, I-4, I-5, and I-6 as necessary.

Comment 26, Section 2.4, Figure 2-1, Following Page 2-25

Modify this figure to show the PGCS and ONCA steam being able to be routed to "phase separation." Show the supernatant/filtrate and backwash; based on Section 2.4.1, paragraph 2, page 2-28; going to both flow equalization and phase separation.

Comment 27, Section 2.4.1, Lines 5 and 8, Page 2-26; and Lines 2 and 9, Page 2-27

After "reduced" insert "(soluble)."

Comment 28, Section 2.4.1, Paragraph 2, Last Sentence, Page 2-27

Clarify if ferrous sulfate is the ENOX catalyst shown on drawings G-4 and I-5.

Comment 29, Section 2.4.1, Paragraph 3, Lines 1 through 4, Page 2-28

Include a more detailed discussion of how carbon exhaustion will be determined and whether or not GAC treatment is necessary to assure effluent limits provided in Enclosure 2 in USEPA March 14, 1996 approval of the modifications of the revised PGCS RD/RA Work Plan will not be exceeded.

Comment 30, Section 2.4.1, Paragraph 2, Lines 11 and 12, Page 2-29

Include the flow recording instrument for discharge flow from the effluent sump and weir box on drawing I-6.

Comment 31, Section 2.4.1, Paragraph 2, Lines 13 and 14, Page 2-29

Provide the turnaround time for sample analysis.

Comment 32, Section 2.4.1, Paragraph 2, Bullet 4, Page 2-30

Based on drawings G-4 and I-3, change the sludge storage tanks from "(2)" to "(1)."

Comment 33, Section 2.4.1, Paragraph 4, Page 2-30

Since the filter press area will be receiving liquids and solids from upstream processes which may contain volatiles by entrainment, justify venting the filter press, the roll-off dumpster, and sump to the outside.

Comment 34, Section 2.4.2, Table 2-7, Page 2-34

Based on this table and drawing I-5 change size of T-7 on drawing G-4 from 1,000 gallons to 7,000 gallons. Clarify that there are 2 air compressors (see Table 2-8, page 2-37), since drawings G-4 and I-6 show only 1 (ME-24).

Comment 35, Section 2.4.3, Table 2-8, Page 2-35

Verify if the catalyst delivery system shown in drawings G-4 and I-5 (Enox Catalyst) is the ferrous sulfate delivery system described in Table 2-7, page 2-34, and Section 2.4.1, Paragraph 1, page 2-28. Add the acid and base delivery system to the pH adjustment tank.

Comment 36, Section 2.4.3, Table 2-8, Page 2-36

Add the acid and base delivery system to the effluent sump and weir box. Change the size of the peroxide storage system from "2,500" to "7,000" gallons and "8' dia X 8' SWD" to "8' dia X 15' SWD" based on Section 7.0, page 6-4.

Comment 37, Section 2.4.3, Table 2-8, Page 2-37

Show the future vapor phase carbon unit in drawings G-4 and I-4. Verify the diatomaceous earth tank and delivery system are not considered a main system component.

Comment 38, Section 2.4.4, Paragraph 2, Page 2-38

Modify the control scheme shown on drawing I-4 for tank T-2 to correspond to the description given here.

Comment 39, Section 2.4.4, Paragraph 4, Page 2-38

Clarify if the metals removal system will be controlled by an equipment vendor supplied PLC, or reference the sections where this information can be found.

Comment 40, Section 2.4.4, Paragraph 3, Page 2-39

Modify the control scheme shown on drawing I-6 for tank T-3 to correspond to the description given here. In line 8 change "influent" to "effluent" based on drawing G-4.

Comment 41, Section 2.4.4, Paragraph 5, Last Sentence, Page 2-39

Include the flow recording instrument for discharge flow from the effluent sump and weir box on drawing I-6, see Comment 30.

Comment 42, Section 2.5, Pages 2-40 and 2-41

Show the relationships between process lines 1 through 6 in Table 2-9 and the design condition shown in Table 2-3, since Table 2-3 shows TSS of 152 mg/l at 55 gpm while Table 2-9 shows TSS of

$$\frac{(155+120)lb/day}{(18{,}700+60{,}500)gal/day}\frac{(453.59g/lb)(1000mg/g)}{3.785l/gal}=416.11mg/lat55gpm$$

Present the mass and flow balance in terms of total pounds per day and pounds per day at major constituents, not just pounds per day of suspended solids. Include the following constituents in the balance:

TDS
TSS

Arsenic
Cadmium
Calcium
Iron
Lead
Magnesium
Mercury
Potassium
Selenium
Zinc

Benzene
1,2-Dichloroethene-cis
Ethylbenzene
Methylene chloride
Tetrachloroethene
Trichloroethene
Vinyl chloride
Acetone
bis(2-Chloroethyl)ether

bis(2-Ethylhexyl)phthalate
2-butanone
Isophorone
4-Methyl-2-pentanone
4-Methylphenol
Pentachlorophenol
PCBs

Total Mass
Total Flow

Comment 43, Section 2.5.1, Paragraph 2, Line 3, Page 2-41

Based on Table 2-9 and Figure 2-2 change "15 gpm" to "13 gpm."

Comment 44, Section 2.5.1, Paragraph 3, Page 2-41

Based on Table 2-1 scenarios and Table 2-9 mass and flow balances increase the average and minimum scenarios by the appropriate amount in process line 12.

Comment 45, Section 2.5, Table 2-9, Page 2-42

Verify that the solids level in process line 7 from ME-28 and process line 13 from ME-2 have not increased due to conversion of dissolved "metals into solid form." Clarify process line 29 since it is shown in Figure 2-2 as both a foul air vent and effluent from filter press ME-12. Based on note 2 in the table, this is a "stage 4" scenario (Table 2-1) material balance. Therefore from Figure 2-2, the influent to T-5 is the sum of process lines 16 and 10 which is 5640 GPD and 522 PPD SS and not process line 19 at 5240 GPD and 522 PPD SS. As a result, the influent to the filter press system is process line 20 at 2090 GPD and 522 PPD SS. The effluent from the filter press system is the sum of process lines 23, 25 and 28 which is 2130 GPD and 522.5 PPD SS. Verify the mass and flow balance around the filter press system.

Comment 46, Section 2.5.1, Paragraph 1, Last Sentence, Page 2-43

The residence time for the phase separator sludge storage system of five days does not agree with the Table 2-7 value of 3.5 days. Clarify. Verify the 9 days storage time for the phase separator sludge storage system (T-10). (See Comment 22).

Comment 47, Section 2.6.1.1, Page 2-43

Based on this paragraph and drawing E-3 add a high-high level switch alarm and flow indicating transmitter to extraction trench pump skematic on drawing I-3. Indicate the trench pumps shall have both a local and remote control switch (HOA).

Comment 48, Section 2.6.1.7, Page 2-45

Clarify if there are more than two sumps as shown on drawing I-6, since drawing S-1 mentions a truck pad with a sump (drawing C-5). Verify if the sludge dewatering area sump pump should have a high level sensor providing input to the MCP, since drawing I-3 doesn't show it and Section 2.6.1.6 doesn't describe it.

Comment 49, Section 2.6.1.8, Last Sentence, Page 2-45

Based on drawing I-4, clarify if the shutdown signal will be sent to the extraction pumps when the high-high level switch is activated.

Comment 50, Section 2.6.1.9, Page 2-45

Based on the information included in this paragraph, modify the piping scheme shown in drawing I-4 for the pretreatment pumps to that shown in Figure 2-2 and drawing G-4. In the last sentence, verify the high-high pretreatment tank level will trigger an alarm at the MCP.

Comment 51, Section 2.6.1.10, Line 7, Page 2-45

Based on drawing G-4; Figure 2-2; Sections 2.6.1.6, 2.6.1.7, and 2.6.1.18; change "collection pumps" to "sump pumps."

Comment 52, Section 2.6.1.12, Paragraph 1, Line 4, Page 2-46

Clarify if the Enox catalyst is ferrous sulfate. See Comment 35.

Comment 53, Section 2.6.1.15, Last Sentence, Page 2-47

Indicate the package unit's control system will provide a system signal to the PLC located in the MCP, as indicated in drawing I-6. Modify drawing I-6 to show the oxidation unit flow rate signal going to the sand filter as indicated on drawing I-5.

Comment 54, Section 2.6.1.16, Line 3, Page 2-47

Modify drawing I-6 to show a control signal going to the effluent pumps.

Comment 55, Section 2.6.1.17, Page 2-47

To be consistent with drawings G-4, Figure 2-2, and I-5, change the title of this section to "Effluent Pumps." Modify drawing I-6 to show a control signal from the pH adjustment tank level going to the effluent pumps, see Comment 54.

Comment 56, Section 2.6.1.18, Page 2-48

Modify this discussion to include the low-level, high level and high-high level switches shown in drawing I-6. Modify drawing I-6 to show the level control signal going to the transfer pumps (process sump pumps).

Comment 57, Section 2.6.1.19, Sentence 1, Page 2-48

According to drawing I-6, there is no relationship between the level in T-4 and pumps P-9 and P-10. Clarify and see Comments 54 and 55.

Comment 58, Section 2.6.1.22, Sentence 1, Page 2-49

Local level indicators are not shown on drawing I-5 for the chemical storage tanks, clarify.

Comment 59, Drawing G-4

Based on drawing I-5, include the T-9 designation for the H_2SO_4 storage tank. Based on drawing I-6, under "Backwash Sump" insert "Collection Tank" for T-4.

Comment 60, Figure 2-2

Based on drawing I-6, under "Backwash Sump" insert "Collection Tank" for T-4. Verify the use of process line identification "29" for both the filter press (ME-12) effluent and foul air vent. See Comment 45.

Comment 61, Drawing I-4

Based on drawing G-4 and Figure 2-2, include "ME-26" designation for the vapor phase GAC unit.

Comment 62, Drawing I-6

Move the "Collection Tank" label to under the "Backwash Sump" label for T-4. Based on drawing G-4 and Figure 2-2 include a sample port between the effluent pumps and the GAC contractors. Change the "Oxidator Flow Rate" label to "UV Oxidation Unit Flow

Rate," based on drawing I-5. Based on drawings G-4, I-5, and Figure 2-2, change the label "pH Adjustment Tank Pumps" to "Effluent Pumps." Based on drawing I-3, include a high level shutdown from the extraction trench pumps.

Comment 63, Drawing C-3

This drawing shows the peroxide storage tank (T-7) at 7,000 gallons as does drawing I-5; however, drawing G-4 shows the vessel at 1,000 gallons and Figure 2-2 shows it at 2,500 gallons. Clarify. See Comment 34.

Comment 64, Section 2.7.0.5, Page 2-50

Locate the emergency eyewash and shower on drawings S-1 and M-1.

Comment 65, Section 2.8.5.1

Indicate on drawing C-3 the treatment building and peroxide storage and containment structure will be built on top of 12 inches of drainage gravel.

Comment 66, Section 3.0, Page 3-1

Include a statement that all ARARs must be complied with.

Comment 67, Section 3.5, Page 3-3

Include a statement that all ARARs must be complied with.

Comment 68, Section 4.1, Page 4-1

Discuss if the treatability studies, described in Appendix B, showed if UV oxidation was able to reduce methylene below IDEM's effluent limit. Identify the Table 2-3 influent concentrations used to establish the operating costs.

Indicate the process elements included in the Table 4-1 capital costs. Describe how the process scheme costed compares to Alternatives C and C* discussed in Appendix C.

Indicate when it will be known if air stripping will be required in the process scheme.

Comment 69, Section 5.0

Since the USEPA is not responsible for site safety, this section was not reviewed.

Comment 70, Section 6.3, Page 6-1

Provide an organization chart including the USEPA and IDEM as well as the individuals listed and their organizations.

Comment 71, Section 6.4.3.2, Page 6-6

Include Mr. Tom Froman in the organization chart.

Comment 72, Section 7.0, Subsection 1.1.1, Paragraph 2, Sentence 2, Page 1-1

See Comment 3.

Comment 73, Section 7.0, Subsection 1.3.2, Table 1-1, Page 1-8

See Comment 7.

Comment 74, Section 7.0, Subsection 1.3.2, Page 1-9

See Comment 8.

Comment 75, Section 7.0, Subsection 1.3.3, Paragraph 1, Sentence 1, Page 1-19

See Comment 9.

Comment 76, Section 7.0, Subsection 1.3.4, Table 1-2, Page 1-13

See Comment 10.

Comment 77, Section 7.0, Subsection 1.3.4, Table 1-3, Pages 1-17 through 1-19

See Comment 11.

Comment 78, Section 7.0, Subsection 1.4.1, Table 1-4, Page 1-21

See Comment 12.

Comment 79, Section 7.0, Subsection 2.1, Paragraph 1, Sentence 2, Page 2-1

See Comment 13.

Comment 80, Section 7.0, Subsection 2.1, Paragraph 2, Page 2-2

Appendix I was not included and therefore it was not reviewed.

Comment 81, Section 7.0, Subsection 2.3, Page 2-4

See Comment 14.

Comment 82, Section 7.0, Subsection 2.4, Sentence 2, Page 2-4

See Comment 25.

Comment 83, Section 7.0, Subsection 2.4.2, Lines 5 and 8, Page 25

After "reduced" insert "(soluble)."

Comment 84, Section 7.0, Subsection 2.4.2, Last Sentence, Page 2-5

See Comment 28.

Comment 85, Section 7.0, Subsection 2.4.6, Lines 1 through 4, Page 2-7

See Comment 29.

Comment 86, Section 7.0, Subsection 2.4.7, Lines 2 and 3, Page 2-8

See Comment 30.

Comment 87, Section 7.0, Subsection 2.4.7, Lines 4 and 5, Page 2-8

See Comment 31.

Comment 88, Section 7.0, Subsection 2.5.1, Bullet 4, Page 2-9

See Comment 32.

Comment 89, Section 7.0, Subsection 2.5.1, Paragraph 2, Page 2-9

See Comment 33.

Comment 90, Section 7.0, Subsection 2.5.3 and Figure 2-1, Page 2-10

See Comment 34 regarding the number of compressors.

Comment 91, Section 7.0, Subsection 2.5.5, Pages 2-10 and 2-11

See Comment 48.

Comment 92, Section 7.0, Subsection 3.2.1 and 3.3.3.4, Pages 3-2 and 3-9

To be consistent with earlier text and Figure 2-1, change the "Chemical Precipitation Unit" to "Rapid Mix Tank and Flocculation Tank."

Comment 93, Section 7.0, Subsection 3.2.2, Line 3, Page 3-3

Since Appendix I was not included, it was not reviewed.

Comment 94, Section 7.0, Subsections 3.3.2.4 and 3.3.2.5, Pages 3-5 and 3-6

To be consistent with earlier text and Figure 2-1 rename the "Intermediate Equalization Tank" to "Pretreatment Equalization Tank," the "Influent (Main) Equalization Tank" to "Equalization Tank," and "Main UV Oxidation System" to "UV Oxidation System."

Comment 95, Section 7.0, Subsection 3.4, Table 3-1, Page 3-12

Identify the priority pollutants.

Comment 96, Section 7.0, Subsection 4.0.1, Last Sentence, Page 4-1

See Comments 14 and 81.

Comment 97, Section 7.0, Subsection 4.2.1, Paragraph 2, Sentence 1, Page 4-5

See Comment 17.

Comment 98, Section 7.0, Subsection 4.3, Paragraph 1, Page 4-5

Appendix II was not included and therefore not reviewed.

Comment 99, Section 7.0, Subsection 5.0.1, Paragraph 2, Sentence 1, Page 2-25

See Comments 25 and 82.

Comment 100 Section 7.0, Subsection 5.1.2, Page 5-2

See Comment 94.

Comment 101, Section 7.0, Subsection 5.1.3, Lines 5, 8, and 10, Page 5-2, and Line 7, Page 5-3

See Comments 27 and 83.

Comment 102, Section, 7.0, Subsection 5.1.3, Line 9, Page 5-3

See Comments 28 and 84.

Comment 103, Section 7.0, Subsection 5.1.4, Page 5-3

See Comment 92.

Comment 104, Section 7.0, Subsection 5.1.7, Lines 1 through 3, Page 5-6

See Comments 29 and 85.

Comment 105, Section 7.0, Subsection 5.1.8, Line 11, Page 5-6, Line 1, Page 5-7

See Comments 30 and 86.

Comment 106, Section 7.0, Subsection 5.1.8, Lines 2 and 3, Page 5-7

See Comments 31 and 87.

Comment 107, Section 7.0, Subsection 5.2.2, Page 5-11

See Comment 38.

Comment 108, Section 7.0, Subsection 5.2.4, Page 5-11

See Comment 39.

Comment 109, Section 7.0, Subsection 5.2.6, Page 5-12

See Comment 40.

Comment 110, Section 7.0, Subsection 5.2.8, Page 5-13

See Comment 43.

Comment 111, Section 7.0, Subsection 5.3, Page 5-14

Appendix II was not included and therefore not reviewed.

Comment 112, Section 7.0, Subsection 5.3.1.3, Page 5-15

Appendix II was not included and therefore not reviewed.

Comment 113, Section 7.0, Subsection 6.2.1, Page 6-1

See Comments 33 and 89.

Comment 114, Section 7.0, Subsection 6.2.2, Page 6-2

See Comment 37.

Comment 115, Section 7.0, Subsection 6.2.3, Page 6-3

Based on Tables 2-7 and 2-8, pages 2-34 and 2-37 in Section 2.0, respectively, change the discharge pressure from 125 psi to 100 psig. See Comments 34 and 90 regarding the number of compressors.

Comment 116, Section 7.0, Subsection 6.2.5, Page 6-3

See Comment 35 regarding the Enox catalyst described in the first bullet.

Comment 117, Section 7.0, Subsection 6.2.5, Page 6-4

Based on Table 2-8 in Section 2.0, change the specifications for the hydrogen peroxide storage tank from "aluminum" to "stainless steel or aluminum." See Comments 34, 36, and 63 regarding the tank's volume.

Comment 118, Section 7.0, Subsection 7.2.3, Last Sentence, Page 7-2

Drawing I-4 does not show this control sequence for the T-2 equalization tank, clarify.

Comment 119, Section 7.0, Subsection 7.3.1, Page 7-3

See Comment 47.

Comment 120, Section 7.0, Subsection 7.3.7, Page 7-5

See Comments 48 and 91.

Comment 121, Section 7.0, Subsection 7.3.8, Page 7-5

See Comment 49.

Comment 122, Section 7.0, Subsection 7.3.9, Page 7-5

See Comment 50.

Comment 123, Section 7.0, Subsection 7.3.10, Page 7-6

See Comment 51.

Comment 124, Section 7.0, Subsection 7.3.12, Page 7-7

See Comment 52.

Comment 125, Section 7.0, Subsection 7.3.14, Page 7-7

To be consistent with earlier text, change the title of this section to "Rapid Mix Tank, Flocculation Tank, and Plate Settler."

Comment 126, Section 7.0, Subsection 7.3.15, Page 7-8

See Comment 53, and change "Chemical Precipitation Unit" to "Rapid Mix Tank, Flocculation Tank, and Plate Settler System."

Comment 127, Section 7.0, Subsection 7.3.16, Page 7-8

See Comment 54.

Comment 128, Section 7.0, Subsection 7.3.17, Page 7-8

See Comment 55.

Comment 129, Section 7.0, Subsection 7.3.18, Page 7-9

See Comment 56.

Comment 130, Section 7.0, Subsection 7.3.19, Page 7-9

See Comment 57.

Comment 131, Section 7.0, Subsection 7.3.22, Page 7-10

See Comment 58.

Comment 132, Section 7.0, Subsection 8.1.2, Page 8-2

Appendix II was not included and therefore not reviewed.

Comment 133, Section 7.0, Subsection 10.3, Page 10-1

Discuss the effectiveness of carbon adsorption for methylene chloride, vinyl chloride, acetone, and 2-butanone.

Comment 134, Section 7.0, Subsection 10.0, Pages 10-1 through 10-6

Indicate the length of time the facility would be shut down if any of the four conditions described in Section 7.4 occur. Estimate how long the facility could be shutdown before loss of containment occurs.

Include a correction plan in accordance with Task 6 (page 25) of the SOW.

Comment 135, Section 7.0, Subsection 10.2, Table 10-1, Page 10-4

Drawing I-3 does not show the automatic facility shutdown when the sump pump motor burns out. Clarify.

Comment 136, Section 7.0, Subsection 10.2, Table 10-1, Page 10-4

Drawing I-6 does not show the automatic facility shutdown when both filtrate and decant sump pumps burn out. Clarify.

Comment 137, Section 8.0, Subsection 8.2.2, Table 8-1, Page 8-4

Change the "Twice per year" frequency of sampling to "Once per quarter."

Comment 138, Appendix A, Tables 1, 2, 3, 4, and 5

Provide the range of accuracy of the cost estimates. Describe the rational for the use of a 10% interest factor and project life of five years to compute present worth. Note that page 27 of the ROD anticipates "30 or more years of aquifer remediation." Identify the operating cost item that includes maintenance and repair costs.

Comment 139, Appendix A, Tables 1 and 2

The chemical dosage cost includes nutrient costs. Identify the processes in Alternatives A and A* requiring nutrient addition.

Comment 140, Appendix A, Paragraph 2, Page 2

Provide the present worth cost for the scenario described here, in Appendix B, and in the stage approach described in Section 2.1.2.

- waste stream flow consisting of PGCS and ONCA
  - capital cost (-1 to 0 years)
  - operating cost (o to w years)
- waste stream flow consisting of OFCA, SBP, PGCS, and ONCA
  - capital cost (w-1 to w years)

- operating cost (w to x years)

- waste stream flow consisting of PGCS and ONCA
  - excess equipment salvage (x years)
  - operating cost (x to final years)

Comment 141, Appendix B, Paragraph 3, Line 2, Page 2

After "oil and grease" insert "(O&G)."

Comment 142, Appendix B, Paragraph 4, Page 5

Based on treatability study results, none of the UV vendors demonstrated success in treating source water. Discuss how other technologies in coordination with UV oxidation, like air stripping, will be evaluated in future treatability studies.

Include the analytical results for the treatability studies described in this Appendix.